

Alternate EMMA Configurations

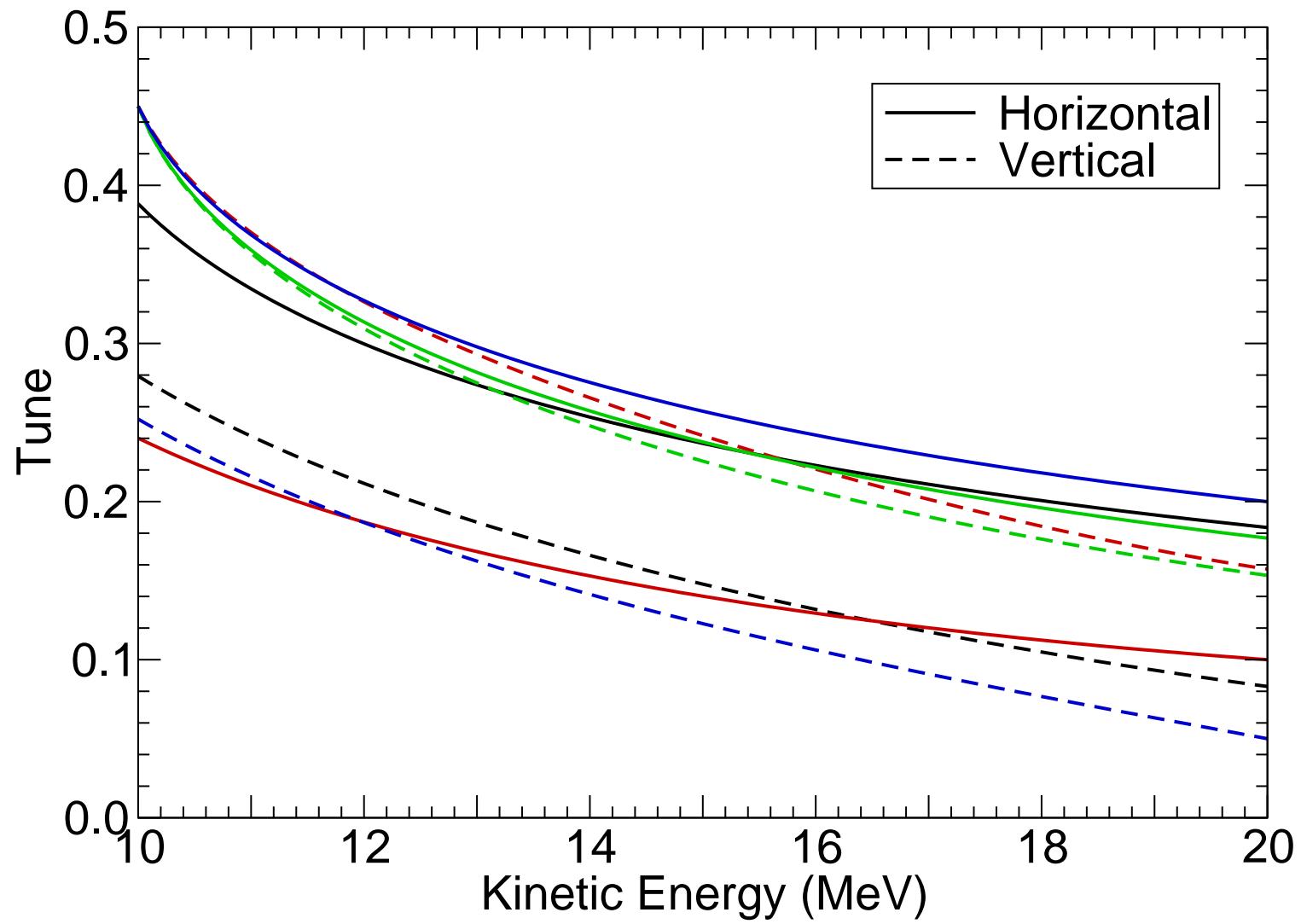
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EMMA Phone Meeting
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Exploring Alternate Configurations

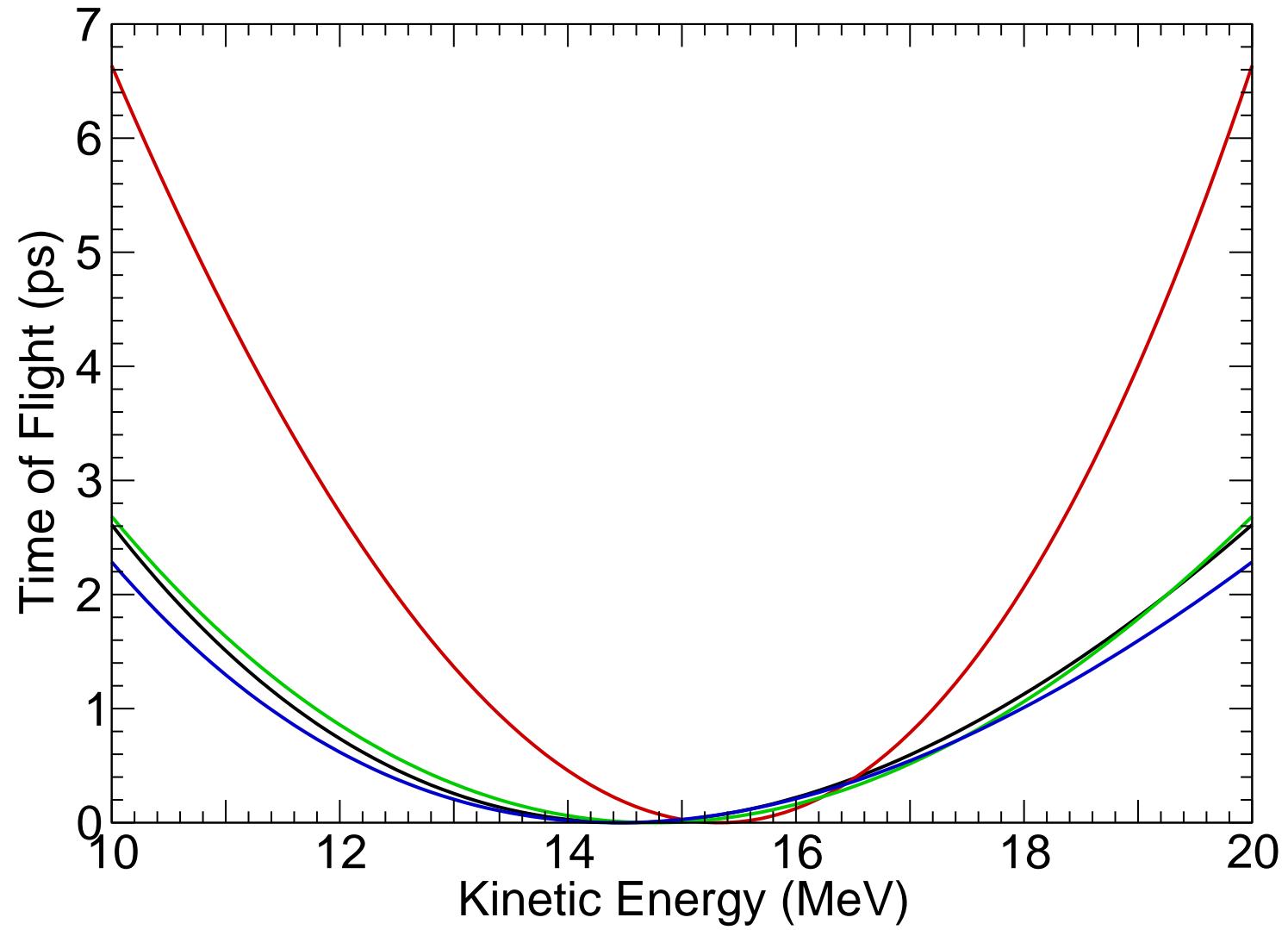
- Would like to vary machine parameters to study FFAG behavior
- First exploration
 - ◆ Vary gradients and fields
 - ◆ Change tune profiles: fix low or high energy tune (at extremes)
 - ◆ Keep time of flight symmetrized (same at low and high energy)
 - ◆ Minimize increase in aperture

	Base	1	2	3
D Field (T)	0.137	0.175	0.148	0.140
D Gradient (T/m)	-4.59	-5.11	-5.90	-4.46
F Field (T)	-0.045	-0.063	-0.060	-0.057
F Gradient (T/m)	6.68	5.21	7.18	7.04

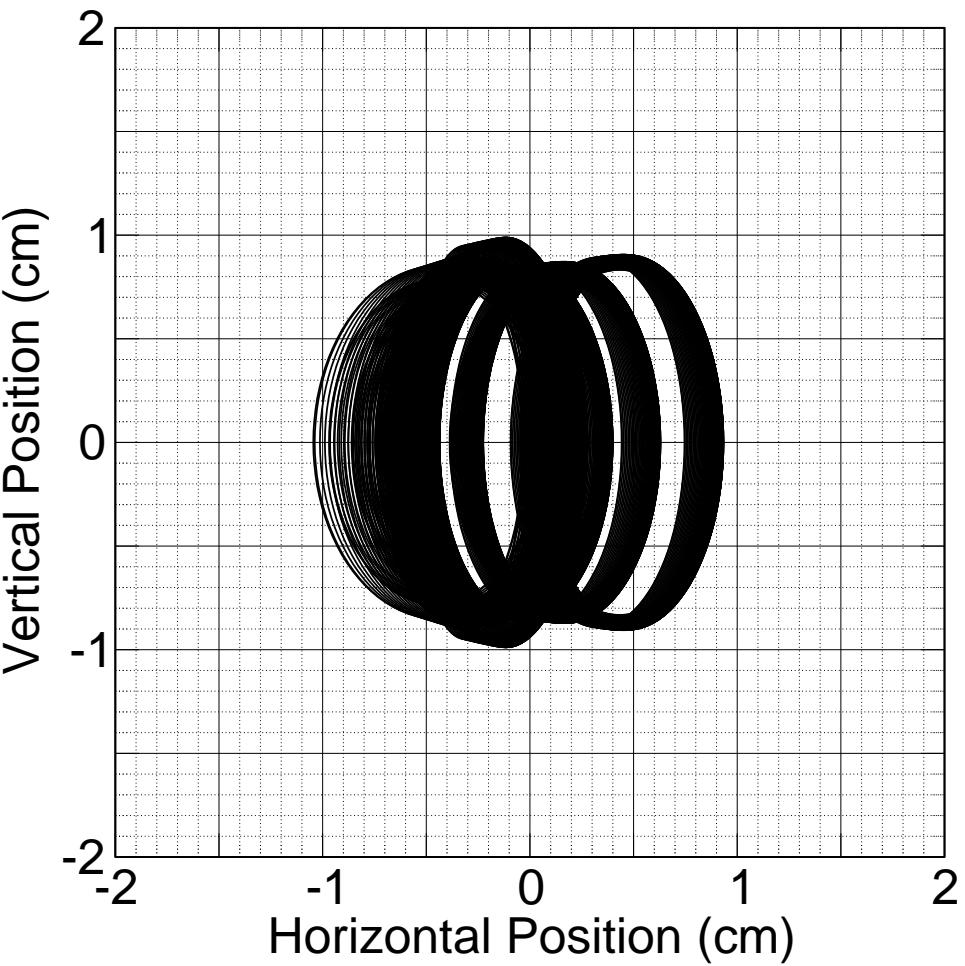
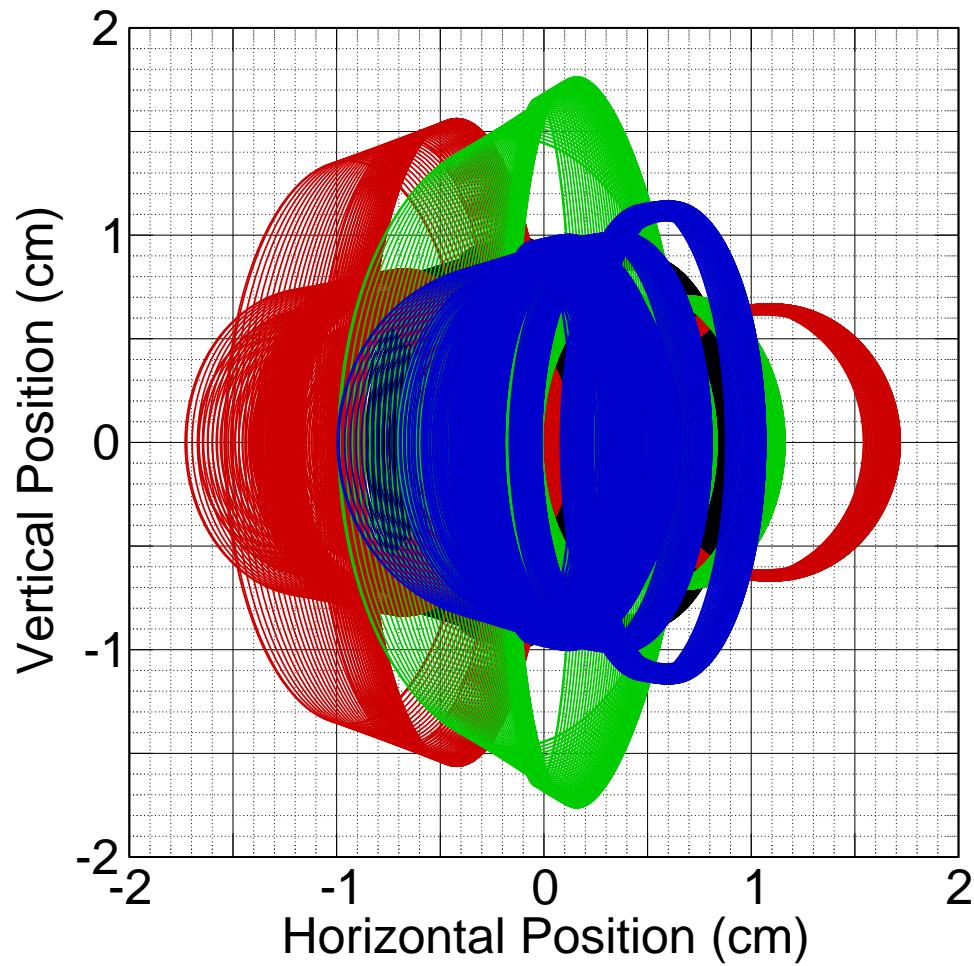
Tunes



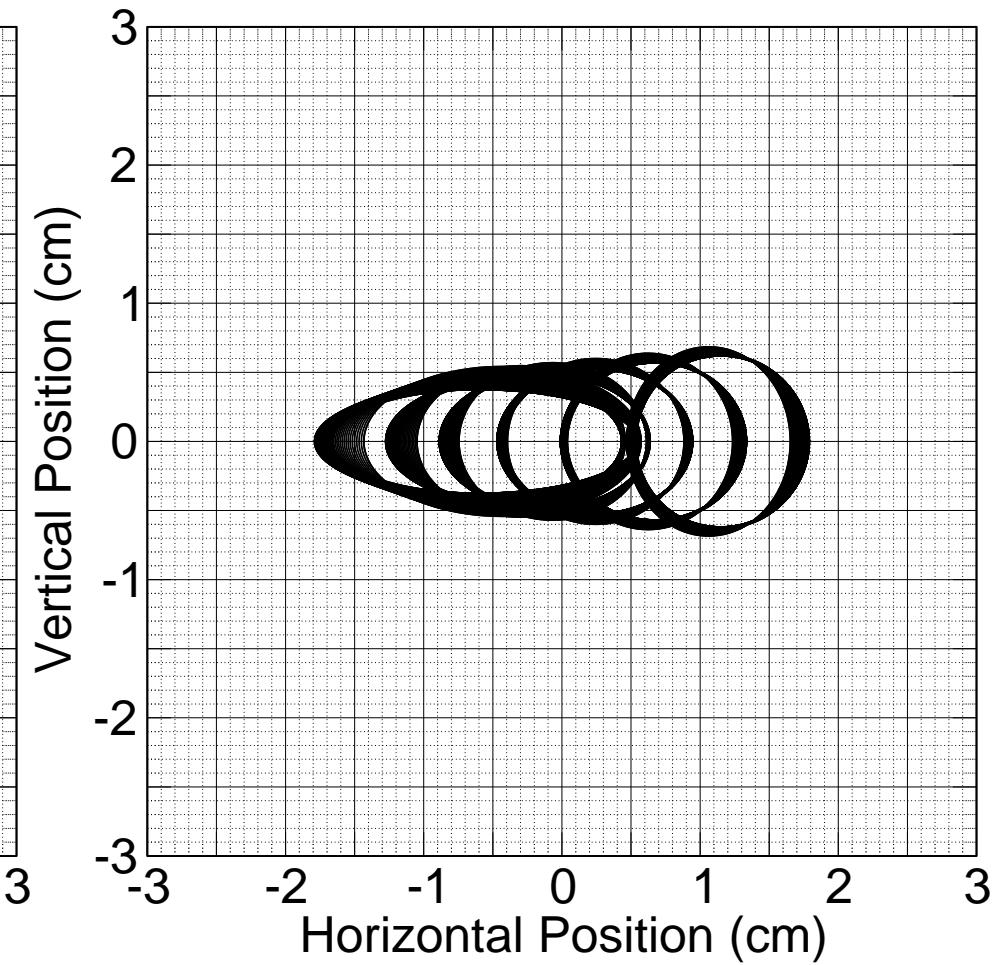
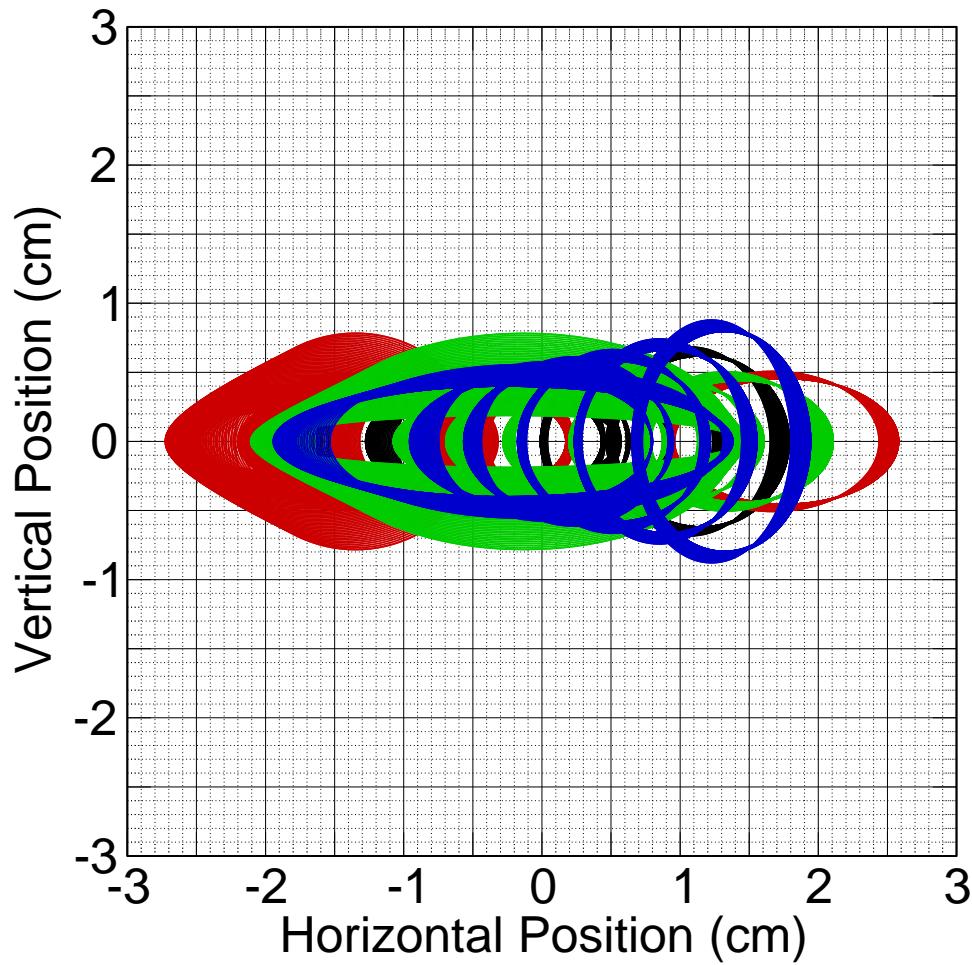
Times of Flight



D Apertures



F Apertures



Observations and Conclusions

- Magnet apertures increase significantly to accommodate alternate configurations
 - ◆ Note I assumed direct control of field and gradient
 - ◆ Will re-do for moving quad
- Gradient variations are around $\pm 25\%$
- Symmetrizing parabola and lowering horizontal tune are incompatible
 - ◆ Thus, no configuration with low tunes in both planes
 - ◆ Also, low tune in horizontal is 0.10, vertical is 0.05
 - ◆ Low horizontal tune requires largest aperture increase
- Next, move parabola center around